**Amendments to the Specification:**

Please replace the title on page 1 at line 1 with the following (deletions shown struck through and additions shown underlined):

~~AN IMPROVED~~ SCANNING PROBE MICROSCOPE WITH IMPROVED PROBE TIP MOUNT

Please add the following paragraph on page 1 at line 3:

This application is a continuation of U.S. Patent Application 10/077,835 filed on February 15, 2002 by Jaewan Hong et al, that is incorporated by reference herein in its entirety.

Please amend the paragraph beginning at page 7, line 22 as follows:

In one embodiment, microscope 30 includes a laser 31, laser beam aligning mechanism (such as a prism) 32, and a photodetector (such as a position sensitive photo detector (PSPD)) 33. Photodetector 33 is supported by z scanner 10 that also supports cantilever 34. This arrangement in microscope 30 is provided to ensure that a laser beam falls on the same point on a cantilever 34, and the reflected beam hits the same point on the ~~PSPD~~ photodetector 33 regardless of the motion of z scanner 10. Therefore, only the deflection of cantilever 34 is monitored on photodetector 33. In the embodiment of FIG. 2, laser 31 and laser beam aligning mechanism 32 are fixed on the probing head.

Please amend the paragraph beginning at page 7, line 13 as follows:

One embodiment of microscope 30 uses a two-dimensional flexure stage 20 to scan a sample chuck 50 (e.g. holding a silicon wafer) in x-y direction only, and a one dimensional piezoelectric actuator 10 to scan a probe cantilever 34 in the z direction only. In FIG. 1, the z scanner 10 is shown attached to a probing head 36 that in turn is shown attached to z stage 73.

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Please amend the paragraph beginning at page 8, line 1 as follows:

The laser beam from laser 31 is reflected by ~~prism~~ laser beam aligning mechanism 32 ~~, both of which are~~ mounted on a glass plate 37. The angle of glass plate 37 (and therefore of ~~prism~~ laser beam aligning mechanism 32) relative to cantilever 34 can be adjusted by two screws 38A and 38B located on the two diagonal corners of a glass plate holder 39. Since the laser beam is falling on cantilever 34 from the vertical direction, the beam always hits the same point on cantilever 34, regardless of motion of z scanner 10.

The paragraph beginning at page 8, line 7, is amended as follows:

The reflected beam from cantilever 34 is bounced by a steering mirror 40 and hits photodetector 33. Mirror 40 of FIG. 2 is supported by the probing head 36, at a position offset from the vertical line passing through ~~prism~~ laser beam aligning mechanism 32. The angle of steering mirror 40 can be slightly adjusted by two screws 41 and 42 on its diagonal edges such that the bounced beam hits the center of ~~PSPD~~ photodetector 33. Since the steering mirror 40 is vertically mounted, the bounced beam always hits the same point on ~~PSPD~~ photodetector 33, regardless of z scanner motion, and therefore only the deflection of the cantilever is detected by ~~PSPD~~ photodetector 33.

The paragraph beginning at page 8, line 15, is amended as follows:

In one embodiment, to accommodate an optical microscope, a clearance is provided above the cantilever 34. For this purpose, the position of ~~PSPD~~ photodetector 33 is lowered relative to laser 31 as shown in FIG. 3. Moreover, the steering mirror 40 is mounted at an angle to the vertical (e.g. 45°) such that the path of bounced laser beam becomes horizontal as shown in FIG. 3. However, in this configuration, the spot formed by the bounced laser beam on the ~~PSPD~~ photodetector 33 changes, as z-scanner 10 moves. When z scanner 10 moves a distance $h$, there is an error of $h(1-\sin 2\theta)$ in the position of the laser beam spot on the ~~PSPD~~ photodetector 33 as shown in FIG. 3. This amount of error is very small compared to the amount of the laser beam spot displacement when the cantilever 34 is deflected by $h$, because changing the angle of the reflected laser beam causes much greater displacement of the laser beam spot on ~~PSPD~~ photodetector (typically 500 times more). Please note that h is exaggerated very much in the drawing to

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illustrate the beam path change. For example, *h* is a very small amount like a few nm to a few μm, while the length of the cantilever is about 100 μm.

The paragraph beginning at page 8, line 29, is amended as follows:

Of course, this error disappears in some embodiments wherein the steering mirror 40 is attached to z scanner. However, scanning only the cantilever 34 and ~~PSPD~~ photodetector 33 with the z scanner in certain embodiments increases bandwidth as compared to also scanning the steering mirror 40 which significantly increases mass and reduces the z- bandwidth.

The paragraph beginning at page 9, line 1, is amended as follows:

Since z scanner motion h is a known quantity, it is possible to compensate for error $h(1-\sin 2\theta)$ in software. An alternative method is to eliminate such error by introducing another mirror 43 (FIG. 4) whose angle is parallel to the angle of steering mirror 40 and the ~~PSPD~~ photodetector 33 is aimed at mirror 43. In the configuration of FIG. 4, second mirror 43 exactly compensates the effect of first mirror 40, and therefore the laser beam hits the same point on ~~PSPD~~ photodetector 33 regardless of z scanner motion.

Please add the following new paragraph on page 10 between lines 13 and 14:

FIGs. 5C, 5D and 5E illustrate, in a side view, a front view, and a top view respectively, an assembly of a scanning probe microscope of the type illustrated in FIGs. 5A and 5B, including x-y scanner 20 and stationary frame 35.

The paragraph beginning at page 11, line 15, is amended as follows:

A tightening mechanism of a dovetail assembly of the probe head 36 with z stage 73 is illustrated in FIGs. 7A- 7D. A bottom dovetail rail 74 is rigidly mounted on the z stage 73. A top dovetail rail 75 has a flexure structure 76 as shown in FIG. 7C. The upper portion 77 of top dovetail rail 75 is rigidly mounted on the z stage but the lower portion 78 can be pushed down by the two screws on each end of the top rail. The screw on the left has a normal right-handed thread, while the screw on the right side has a

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left-handed thread. Each screw has a removable handle, which can be slid out and re-inserted in any of twelve possible angles as shown in FIG. 7D. A user can select any appropriate angle such that the last 90° turn makes firm clamping (or releasing) of the ~~top dovetail rail~~ lower portion 78 against the head 36.

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